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HEART FAILURE

Drugs outperform ultrafiltration in acute cardiorenal syndrome

Around 25–33% of patients with acute decompensated heart failure develop worsening kidney function, a condition referred to as acute cardiorenal syndrome (type 1). Diuretics are commonly used to treat persistent congestion in these patients, but these drugs might worsen kidney function. An alternative therapeutic approach is venovenous ultrafiltration, which can improve control over the rate and volume of fluid removal, increase net loss of sodium, and reduce neurohormonal activation. To address the lack of data on the use of ultrafiltration in patients with acute decompensated heart failure, investigators designed CARRESS-HF, the results of which were presented at the AHA 2012 Scientific Sessions and published in the *New England Journal of Medicine*.

Patients with acute cardiorenal syndrome ($n = 188$; median ejection fraction 33%) were randomly allocated to either stepped pharmacological therapy (intravenous diuretics adjusted according to a detailed algorithm to maintain a urine output of 3–5 l per day) or ultrafiltration (fluid removal at a rate of 200 ml/h). Owing to the nature of the interventions, this trial was neither blinded nor placebo-controlled.

Ultrafiltration was found to be inferior to pharmacological therapy when the primary end point (bivariate change in serum creatinine level and body weight) was assessed 96 h after randomization. Compared with baseline, the creatinine level decreased by 0.04 ± 0.53 mg/dl with pharmacological therapy, but increased by 0.23 ± 0.70 mg/dl with ultrafiltration. Patients in both groups lost a similar amount of weight (5.5 ± 5.1 kg vs 5.7 ± 3.9 kg).

More patients receiving ultrafiltration experienced a serious adverse event (kidney failure, bleeding complications, or intravenous catheter-based complications) over the 60-day follow-up period compared with those receiving pharmacological therapy, although mortality was not significantly different between the two groups (17% vs 13%, respectively). Investigators originally intended to enroll 200 patients, but recruitment was stopped on the advice of the data and safety monitoring board after 188 patients had been enrolled because of "a lack of evidence of benefit, as well as an excess of adverse events, with ultrafiltration".

The investigators conclude that "given the high cost and complexity of ultrafiltration, the use of this technique as performed in the current study does not seem justified". However, in an Editorial that accompanied the trial report, Dr W. H. Wilson Tang comments that "a slower but steady ultrafiltration rate may help [to] maintain an adequate plasma refill rate ... the ultimate goal is to relieve congestion safely and not to show how promptly the excess volume can be removed. Therefore, future studies are needed to determine the safest and most effective rate, duration, and amount of sodium and volume removal with ultrafiltration."

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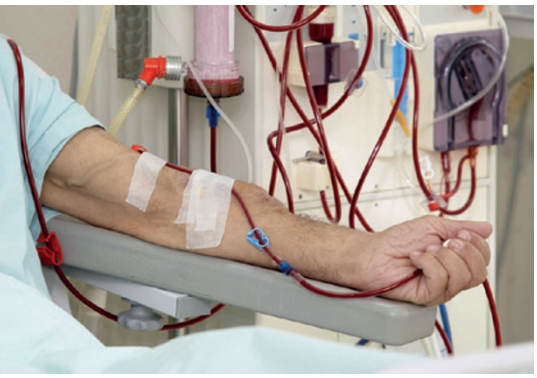

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